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10/506,977	09/08/2004	Yoshio Yoshida	TAKIT-0189	6913
23599 7590 07/31/2008 MILLEN, WHITE, ZELANO & BRANIGAN, P.C. 2200 CLARENDON BLVD. SUITE 1400 ARLINGTON, VA 22201				
EXAMINER SHEWAREGED, BETTELHEIM				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/506,977

Applicant(s)

YOSHIDA ET AL.

Examiner

Betelhem Shewareged

Art Unit

1794

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-6,8-10 and 13-31 is/are pending in the application.
- 4a) Of the above claim(s) 29-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-6,8-10 and 13-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-083)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's response filed on 05/14/2008 has been fully considered. Claims 1 and 13 are amended, claims 2, 7, 11 and 12 are canceled, claims 22-31 are added, and claims 1, 3-6, 8-10 and 13-31 are pending. Currently, claims 29-31 are withdrawn from consideration for the reason below.

Election/Restrictions

2. Newly submitted claims 29-31 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Forming a thin recording film comprising the claimed polyvinyl alcohol, the claimed pigment and a crosslinking agent, and laminating the thin recording film on a substrate.
3. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 29-31 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 8, 13-16, 20, 22, 23, 25 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukoyoshi et al. (US 6,242,082 B1) in view of Urasaki (US 6,403,198 B1) and Saito et al. (US 6,197,381 B1).

6. Mukoyoshi teaches an ink jet recording sheet comprising a support, at least one ink receiving layer on the support and a gloss layer on the ink receiving layer (abstract). The gloss layer meets the claimed high gloss cast coating, and the ink receiving layer meets the claimed under layer. The support comprises a paper having air permeability (col. 3, line 40). The gloss layer comprises a binder such as polyvinyl alcohol, and a pigment selected from at least silica and alumina, wherein the particle size of the silica is 10-400nm (col. 8, line 40 thru col. 9, line 20). The particle size of alumina is 0.01-5µm (col. 8, lines 58). The gloss layer further comprises a cationic substance (col. 9, line 10). In one of the Examples, the amount of polyvinyl alcohol is 10 part based on 100 parts of pigment (col. 13, lines 30-42). The coating amount of the gloss providing layer is 0.2-30 gsm (col. 11, line 17). Even though Mukoyoshi does not teach a combination of alumina and silica, it would be obvious to combine both alumina and silica so as to provide a layer having the same effect. *In re Crockett*, 126 USPQ 186. It is obvious to combine separately taught prior art ingredients which perform the same function; it is logical that they would produce the same effect and supplemental each other. With respect to the ratio of alumina to silica, the experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. *In re Aller*, 105 USPQ 233. One of ordinary skill in the art would have been motivated to adjust the ratio of alumina

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to silica, and the motivation would be to control the gloss property of the layer and control the color density of the ink. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. *In re Boesch and Slaney*, 205 USPQ 215.

7. The gloss layer is formed by a wet casting method in which the surface of the ink receiving layer is coated with a coating liquid containing a resin and a pigment; the coating liquid layer is brought, while the layer is kept in the wetted condition, into contact under pressure with a mirror-finished casting surface of a heated casting drum; the coating liquid layer is dried; and then the dried gloss layer is separated from the casting drum surface (col. 10, line 20).

8. Mukoyoshi does not teach two kinds of polyvinyl alcohols. However, Urasaki teaches an ink jet recording medium comprising at least two kinds of polyvinyl alcohols (abstract). Urasaki further teaches the at least two kinds of polyvinyl alcohols are polyvinyl alcohol having a saponification degree of 92% or higher and a polymerization degree of 2500 or lower; and polyvinyl alcohol having a saponification degree of 90% or lower and a polymerization degree of 2000 or higher (col. 4, lines 42-46). The relation of contents of the polyvinyl alcohol having a saponification degree of 92% or higher and the polyvinyl alcohol having a saponification degree of 90% or lower is between 4 and 40, inclusive (col. 5, lines 1-13), which overlaps with the claimed range of between 20 and 80, inclusive. Mukoyoshi and Urasaki are analogous art because they are from the same field of endeavor that is the ink jet recording medium art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine

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the at least two kinds of polyvinyl alcohols of Urasaki with the invention of Mukoyoshi to inhibit cracking of the coat (col. 4, line 19 of Urasaki).

9. Mukoyoshi does not teach the use of boric acid and borate as a hardener.

However, Saito teaches a recording sheet containing a hardener such as boric acid and salts thereof (col. 6, lines 26-45). Saito further teaches a step of forming a composition containing hardener, and applying the hardener containing composition on the top as a separate layer (col. 7, lines 4-7). Even though Saito does not teach a combination of boric acid and salt thereof, it would be obvious to combine both boric acid and salt thereof in order to provide a layer having the same effect. *In re Crockett*, 126 USPQ 186. It is obvious to combine separately taught prior art ingredients which perform the same function; it is logical that they would produce the same effect and supplemental each other. With respect to the ratio of boric acid and salt thereof, the experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. *In re Aller*, 105 USPQ 233. One of ordinary skill in the art would have been motivated to adjust the ratio of boric acid and salt thereof, and the motivation would be to control the hardening effect of the binder, and also to control cracking of the layer. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. *In re Boesch and Slaney*, 205 USPQ 215. Mukoyoshi and Saito are analogous art because they are from the same filed of endeavor that is the ink jet recording sheet art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine

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the teaching of Saito with the invention of Mukoyoshi, and the motivation would be, as Saito suggests, decreasing cracking of the recording sheet (col. 6, line 27).

10. Claims 21, 24, 26 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukoyoshi et al. (US 6,242,082 B1) in view of Urasaki (US 6,403,198 B1) and Saito et al. (US 6,197,381 B1).

11. Mukoyoshi teaches an ink jet recording sheet comprising a support, at least one ink receiving layer on the support and a gloss layer on the ink receiving layer (abstract). The gloss layer meets the claimed high gloss cast coating, and the ink receiving layer meets the claimed under layer. The support comprises a paper having air permeability (col. 3, line 40). The gloss layer comprises a binder such as polyvinyl alcohol, and a pigment selected from at least silica and alumina, wherein the particle size of the silica is 10-400nm (col. 8, line 40 thru col. 9, line 20). The particle size of alumina is 0.01-5µm (col. 8, lines 58). The gloss layer further comprises a cationic substance (col. 9, line 10). In one of the Examples, the amount of polyvinyl alcohol is 10 part based on 100 parts of pigment (col. 13, lines 30-42). The coating amount of the gloss providing layer is 0.2-30 gsm (col. 11, line 17). Even though Mukoyoshi does not teach a combination of alumina and silica, it would be obvious to combine both alumina and silica so as to provide a layer having the same effect. *In re Crockett*, 126 USPQ 186. It is obvious to combine separately taught prior art ingredients which perform the same function; it is logical that they would produce the same effect and supplemental each other. With respect to the ratio of alumina to silica, the experimental modification of this

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prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. *In re Aller*, 105 USPQ 233. One of ordinary skill in the art would have been motivated to adjust the ratio of alumina to silica, and the motivation would be to control the gloss property of the layer and control the color density of the ink. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. *In re Boesch and Slaney*, 205 USPQ 215.

12. The gloss layer is formed by a wet casting method in which the surface of the ink receiving layer is coated with a coating liquid containing a resin and a pigment; the coating liquid layer is brought, while the layer is kept in the wetted condition, into contact under pressure with a mirror-finished casting surface of a heated casting drum; the coating liquid layer is dried; and then the dried gloss layer is separated from the casting drum surface (col. 10, line 20).

13. Mukoyoshi does not teach two kinds of polyvinyl alcohols. However, Urasaki teaches an ink jet recording medium comprising at least two kinds of polyvinyl alcohols (abstract). Urasaki further teaches the at least two kinds of polyvinyl alcohols are polyvinyl alcohol having a saponification degree of 92% or higher and a polymerization degree of 2500 or lower; and polyvinyl alcohol having a saponification degree of 90% or lower and a polymerization degree of 2000 or higher (col. 4, lines 42-46). The relation of contents of the polyvinyl alcohol having a saponification degree of 92% or higher and the polyvinyl alcohol having a saponification degree of 90% or lower is between 4 and 40, inclusive (col. 5, lines 1-13), which overlaps with the claimed range of between 20

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and 80, inclusive. Mukoyoshi and Urasaki are analogous art because they are from the same field of endeavor that is the ink jet recording medium art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the at least two kinds of polyvinyl alcohols of Urasaki with the invention of Mukoyoshi to inhibit cracking of the coat (col. 4, line 19 of Urasaki).

14. Mukoyoshi does not teach the use of boric acid and borate as a hardener. However, Saito teaches a recording sheet containing a hardener such as boric acid and salts thereof (col. 6, lines 26-45). Saito further teaches a step of forming a composition containing hardener, and applying the hardener containing composition on the top as a separate layer (col. 7, lines 4-7). Even though Saito does not teach a combination of boric acid and salt thereof, it would be obvious to combine both boric acid and salt thereof in order to provide a layer having the same effect. *In re Crockett*, 126 USPQ 186. It is obvious to combine separately taught prior art ingredients which perform the same function; it is logical that they would produce the same effect and supplemental each other. With respect to the ratio of boric acid and salt thereof, the experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. *In re Aller*, 105 USPQ 233. One of ordinary skill in the art would have been motivated to adjust the ratio of boric acid and salt thereof, and the motivation would be to control the hardening effect of the binder, and also to control cracking of the layer. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. *In re Boesch and Slaney*,

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205 USPQ 215. Mukoyoshi and Saito are analogous art because they are from the same filed of endeavor that is the ink jet recording sheet art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Saito with the invention of Mukoyoshi, and the motivation would be, as Saito suggests, decreasing cracking of the recording sheet (col. 6, line 27).

15. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mukoyoshi et al. (US 6,242,082 B1) in view of Urasaki (US 6,403,198 B1) and Saito et al. (US 6,197,381 B1), as applied to claim 1 above, and further in view of Ichioka et al. (US 6,177,188 B1).

16. Mukoyoshi does not teach polyacrylamine hydrochloride as the cationic compound. However, Ichioka teaches an ink jet recording medium comprising polyacrylamine hydrochloride as a cationic substance (col. 11, line 7). Mukoyoshi and Ichioka are analogous art because they are from the same filed of endeavor that is the ink jet recording medium art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the polyacrylamine hydrochloride of Ichioka with the invention of Mukoyoshi in order to improve the water resistance of the printed matter formed using an ink jet ink (col. 6, lines 30-32 of Ichioka).

17. Claims 4, 9, 10 and 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mukoyoshi et al. (US 6,242,082 B1) in view of Urasaki (US 6,403,198

B1) and Saito et al. (US 6,197,381 B1), as applied to claim 1 above, and further in view of Yasuda et al. (US 5,213,873).

18. Mukoyoshi does not teach ink receiving layer as recited in the claimed invention. However, Yasuda teaches an ink jet recording sheet comprising a substrate and an image receiving layer on the substrate (abstract). The image receiving layer comprises a binder and silica particles having oil absorption of 150ml/100g or more (col. 5, lines 5-8). The silica particles are mixed with ground calcium carbonate (col. 7, line 3). The amount of the binder in the image receiving layer is 15-40% by weight (col. 7, line 21). The particle size of the silica particles is preferably 4 μ m or less (col. 6, line 19). Mukoyoshi and Yasuda are analogous art because they are from the same field of endeavor that is the inkjet recording sheet art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the image receiving layer of Yasuda with the invention of Mukoyoshi in order to improve the capacity of absorbing an aqueous ink at a high speed and in a large amount, and of forming ink images thereon at a high speed and at a high resolving power, without creating curling, undulations or waving therein, and also to improve the capacity of forming ink images having a high water resistance and storage durability without curling and undulations, and having an easy handling property (see col. 3, line 65 thru col. 4, line 8 of Yasuda).
19. With respect to the particle size and the amount of the ground calcium carbonate in the layer, the experimental modification of this prior art in order to ascertain optimum operating conditions fails to render applicants' claims patentable in the absence of unexpected results. *In re Aller*, 105 USPQ 233. One of ordinary skill in the art would

have been motivated to adjust the particle size and the amount of the ground calcium carbonate in order to control the brightness and whiteness of the layer. A prima facie case of obviousness may be rebutted, however, where the results of the optimizing variable, which is known to be result-effective, are unexpectedly good. *In re Boesch and Slaney*, 205 USPQ 215.

20. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mukoyoshi et al. (US 6,242,082 B1) in view of Urasaki (US 6,403,198 B1) and Saito et al. (US 6,197,381 B1), as applied to claim 1 above, and further in view of Barcock et al. (US 5,246,774).

21. Mukoyoshi does not teach the use of cationic silica in the gloss layer. However, Barcock teaches an ink jet recording material comprising an upper layer containing cationic silica (col. 3, line 1). Mukoyoshi and Barcock are analogous art because they are from the same filed of endeavor that is the ink jet recording material art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the cationic silica of Barcock with the invention of Mukoyoshi, and the motivation would be to control the gloss property and ink absorbing property of the layer.

22. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mukoyoshi et al. (US 6,242,082 B1) in view of Urasaki (US 6,403,198 B1) and Saito et

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al. (US 6,197,381 B1), as applied to claim 1 above, and further in view of Sakaki et al. (US 5,246,774).

23. Mukoyoshi does not teach alumina having a gamma structure. However, Sakaki teaches a recording medium comprising alumina particles having a gamma structure (col. 8, line 22), and a particle diameter of 1nm to 10um (col. 9, line 1). Mukoyoshi and Sakaki are analogous art because they are from the same filed of endeavor that is the ink jet recording medium art. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the alumina particles of Sakaki with the invention of Mukoyoshi so as to improve the effect of capturing dyes in the layer (col. 8, line 60 of Sakaki), and enhance print quality by reducing blurs and feathering (col. 9, lines 3-5 of Sakaki).

Response to Arguments

24. Applicant's argument is based on that none of the references teaches or suggests hardening the coating layer by solidifying method as recited in the claimed invention. This argument is not persuasive for the following reason. Saito teaches the step of forming the composition containing hardener, and applying the hardener containing composition on the top as a separate layer (col. 7, lines 4-7), and also teaches the coating composition containing the hardener is preferably supplied as the same time when the void layer is formed (col. 7, lines 9-12). If the coating of the two layers is done at the same time, the hardener containing layer is being applied while the void layer is still wet, which teaches the claimed invention.

25. Applicant further argued that none of the references teaches or suggests the use of a combination of boric acid and borate. This argument is not persuasive for the following reason. Saito teaches hardener such as boric acid and salts thereof (col. 6, line 50). Even though Saito does not teach the use of a combination of boric acid and salt thereof, it would be obvious to combine both boric acid and salt thereof in order to provide a layer having the same effect. *In re Crockett*, 126 USPQ 186. It is obvious to combine separately taught prior art ingredients which perform the same function; it is logical that they would produce the same effect and supplemental each other.

26. Applicant also argued that Urasaki teaches away from using boric acid and borate to solidify polyvinyl alcohol. This argument is not persuasive because the reference of Urasaki is used to teach the claimed two types of binders, not used to teach the claimed hardeners. The hardeners are taught by the reference of Saito.

27. For the above reasons claims 1, 3-6, 8-10 and 13-21 stand rejected, and claims 22-28 are included in the rejection.

Conclusion

28. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Betelhem Shewareged whose telephone number is (571)272-1529. The examiner can normally be reached on Monday-Friday 9am-5pm.

29. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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30. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BS

July 27, 2008.

/Betelhem Shewareged/
Primary Examiner, Art Unit 1794.